

CLAIMS

1. A subsea process assembly for separating a multiphase flow, the assembly comprising:
 - 5 an inlet for a multiphase medium; - a pressure reducing means for reducing the pressure of the multiphase flow from the inlet and creating a source of energy; - a multiphase separator for separating the multiphase input into individual phases; - and
 - 10 a pumping system for, in use, pumping at least one of the desired individual phases to a delivery point by utilising of the energy from the source of energy.
2. A subsea process assembly according to claim 1, wherein the pressure reducing means is one of a hydraulic power device, electric power drive and a flow controller.
- 15 3. A subsea process assembly according to either claim 1 or claim 2, further comprising a control process module for controlling the pressure reducing means and the pumping system.
- 20 4. A subsea process assembly according to any of the preceding claims, further comprising a power drive unit that generates hydraulic power from an external energy source.
5. A subsea process assembly according to claim 4, wherein the external energy
25 source is either in the form of fluid or electrical energy.
6. A subsea process assembly according to claim 5, wherein the power drive unit and/or the pressure reducing means is driven by a fluid which provides energy in the form of liquid or gas.
- 30 7. A subsea process assembly according to claim 6, wherein the wellstream energy is achieved by creating a pressure differential in the multiphase flow between the inlet and the separator.
- 35 8. A subsea process assembly according to any one of the preceding claims, further comprising a drive fluid inlet, the drive fluid being pumped to the module from an external point.

9. A subsea process assembly according to any one of the preceding claims, wherein the pressure reducing means further comprises a means for creating a pressure differential in the drive fluid and thereby creating a further source of energy.

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10. A subsea process assembly according to either claim 4 or claim 5, wherein the drive fluid is water from a water injection supply.

11. A subsea process assembly according to any one of the preceding claims, wherein
10 the pressure of the multiphase flow is reduced to below 25 atmospheres.

12. A subsea process assembly according to any one of the preceding claims, wherein the multistage separator can be formed by at least one of the following: a centrifugal container, a vortex tube, a cyclone, helix container or auger, a gravity vertical or horizontal
15 tank, a silo, a conductor pile housing, toroidal ring, a toroidal spiral combination or a spiral.

13. A subsea process assembly according to any one of the preceding claims wherein the separating process can separate the multiphase fluid into at least two of the following: a solids slurry, gas, oil and water.

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14. A subsea process assembly according to any one of the preceding claims, further comprising an individual pump for each phase.

15. A subsea process assembly according to claim 14, wherein the individual phase
25 pumps are driven by the energy created in the assembly.

16. A subsea process assembly according to any one of the preceding claims further comprising of a solids removal unit for removing a solids slurry prior to separation.

30 17. A subsea process assembly according to any one of the preceding claims, further comprising a means for, in use, injecting exhaust water into a well.

18. A subsea process assembly according to any one of the preceding claims, further comprising a template, a piping mat and a retrievable subsea process module.

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19. A subsea process assembly according to claim 18, wherein the retrievable subsea process module comprises a retrievable base module and retrievable mini modules.

20. A subsea hydrocarbon recovery system comprising:
a subsea well for supplying a multiphase fluid;
a subsea process assembly according to any one of the preceding claims, wherein
5 the inlet to the assembly is in fluid communication with the well; and
a delivery point for receiving the recovered hydrocarbon(s) from the subsea
process assembly.
21. A subsea hydrocarbon recovery system according to claim 20, further comprising
10 a well into which surplus products of the separation can be reinjected.
22. A subsea hydrocarbon recovery system according to either claim 20 or claim 21,
further comprising a plurality of subsea wells, each having an associated subsea process
module which supplies the recovered hydrocarbon(s) to the same delivery point.
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23. A subsea hydrocarbon recovery system according to any one of claims 20 to 22,
wherein the delivery point is one of: a pipeline for removing the product from the field, a
water injection well, a gas injection well or a producing well to achieve artificial lift.

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